

MLP 7222
PATENT

REMARKS

Claims 1 and 10 are amended herein. Claim 22 is cancelled.
Claims 1-21 will be pending upon entry of this amendment.

Response to Rejection of Claims Under §102

Claim 10

The undersigned is very grateful for the opportunity to speak with Examiner Saether on May 16, 2005. The undersigned has carefully considered the Examiner's remarks and concerns and believes that the above amendments adequately address such remarks and concerns.

As amended, claim 10 now recites, among other things, that the tip tapers along its entire length to a point, and the tip is free of any screw threads. Because the tip of the screw is free of any screw threads, only a cutting edge (35) of the tip taps the bore, making the screw less likely to split the wood than if screw threads were formed on the tip. The claim also recites that the shank has a constant diameter along its entire length and the entirety of the screw thread has a uniform height projecting from the outer surface of the shank. A screw having threads with uniform height is easier to manufacture than a screw having a thread with a non-uniform height. Moreover, when a screw with a flute defining a cutting edge on the tip for forming a bore is threaded into wood, a screw with thread having a uniform height is less likely to split the wood than a screw with a thread having non-uniform height. Also, because the shank has a uniform diameter along its entire length, the entire thread also has a uniform height, and the tip is free from threads, the distance between the thread and the axis of the shank is constant along the entire length of the shank.

More specifically, claim 10 is directed to a self tapping screw comprising:

MLP 7222
PATENT

a head;

a tip tapering along its entire length to a point, the tip being free of any screw threads;

a shank having an outer surface, the shank extending from the head to the tip and having a constant diameter along its entire length;

a screw thread projecting outward from the outer surface of the shank and extending continuously from a start location between the head and the tip to the tip, an entirety of the screw thread having a uniform height, the shank having a constant maximum radius at least from the start location to the tip;

a drill section generally at the tip of the screw, the drill section being defined by at least one flute formed in the tip and the shank, the flute defining a cutting edge on the tip for forming a bore having a diameter equal to the diameter of the shank from the start location to the tip;

the flute further defining a thread tapping edge at the intersection of the flute with the thread at a position nearest to the tip.

Claim 10, as amended, is unanticipated by, nonobvious in view of, and patentable over the references of record, and in particular U.S. Patent No. 1,294,268 (Holmes et al.), in that whether considered alone or in combination, the references fail to show or suggest a self tapping screw that includes a shank extending from the head of the screw to the tip having a constant diameter, a tip tapering along its entire length to a point and being free of any screw threads, and a screw thread having a uniform height projecting outward from the outer surface of the shank and extending from a start location between the head and the tip to the tip.

MLP 7222
PATENT

As acknowledged by the Examiner, Holmes et al. fail to disclose a screw with an entirety of a screw thread having a uniform height that extends to a tip, where the entire tip tapers to a point and is free of any screw threads. Accordingly, Holmes et al. do not anticipate claim 10.

In the Response to Remarks section and during the telephone conference on May 16, the Examiner suggested that claim 10, even if amended to recite that the entire screw thread has a uniform height, may be obvious in view of Holmes et al. in combination with the teachings of the other references of record. In response, Applicants further amended the claims and now believe claim 10 is nonobvious over the references of record. More specifically, Applicants believe that no combination of references teaches or suggests a screw having a shaft with a constant diameter along its entire length, a tip that is tapered along its entire length and free of screw threads, and a screw thread that extends to the tip, where the entire thread has a uniform height.

For example, Chen et al., just like Holmes et al., teach that when a tip is present, threads of a non-uniform height are used. Chen et al. disclose a screw for fibrous boards. As taught by the reference, when a conventional self-drilling screw with a drill bit portion is applied to a fibrous board, the drill bit portion damages the board such that a relatively weak binding force is present between the fibrous board and the threaded shank portion of the screw. Column 1, lines 17-21. Accordingly, in a first embodiment (in which the screw thread appears to be entirely uniform), the screw (4) is free of a drill bit portion, and the tip of the screw is flat (i.e., there is no tip). As shown in the Figures, the screw is tapped into a pre-drilled bore hole. As also taught by the reference, in a second embodiment, the screw (6) has a shank that tapers to a tip. Importantly the

MLP 7222
PATENT

height of the thread decreases as it extends to this tapering section of the shank.

Combining the teachings of Holmes et al. with the teachings of Chen et al. to render claim 10 obvious would not be proper because there is no motivation to combine the references.

There is no motivation to modify the screw in Holmes et al., which teaches a thread having a non-uniform height, to have the entirety of the screw thread having a uniform height because Chen et al. teaches only a screw without a tapering tip (i.e., a screw with a flat tip) having a uniform thread height. This construction makes sense with the screw in Chen et al. because it is used with pre-drilled bore holes. As shown in Fig. 4, the bore hole is the same size or slightly smaller than the shank of the screw, and therefore, a thread having a uniform height can easily penetrate the walls of the bore hole, making the need for a non-uniform thread unnecessary. In contrast, as shown by the second embodiment, Chen et al. teaches a screw with a tapered shank having a non-uniform thread height (Fig. 5). Accordingly, Chen et al. appears to be teaching that if the screw is for use with pre-drilled bore holes (i.e., a screw not having a drill section), then the screw thread is uniform, but if the screw is not used with pre-drilled bore holes, then the screw thread is non-uniform. This teaching is clearly contrary to claim 10.

Likewise, there is also no motivation to modify the screw in Chen et al. in view of the teachings of Holmes et al. to make a screw embodying all of the elements of claim 10. As stated above, Chen et al. clearly teach against such a modification. That is, Chen et al. teach away from modifying the screw to have a drill bit portion and a tapering tip free of any screw threads. Moreover, there is also no disclosure or suggestion in Holmes et al. to modify Chen et al. because Holmes et al. teach using a screw thread of non-uniform height with a screw having a drill bit portion and a tapering tip. It is not proper to pick and

MLP 7222
PATENT

choose among the various teachings in a prior art reference. Instead, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. M.P.E.P §2141.02. Accordingly, the conflicting teachings of these references as a whole cannot be reconciled, and therefore it is not proper to modify the screw taught by Chen et al. according to the teachings of Holmes et al. to render claim 10 obvious.

The other references of record similarly fail to show or suggest all of the elements of claim 10.

Accordingly, proposed claim 10 is submitted to be non-obvious and patentable over the references of record.

Proposed claims 11-21 depend directly or indirectly from claim 10 and are patentable for at least the same reasons as claim 10.

Response to Rejection of Claims Under §103

Claim 1

Claim 1 is directed to a screw, comprising:

a shank;

a head at one end of the shank and a tip at the other end of the shank, the shank having an outer surface, the shank being of substantially constant maximum radius between the head and the tip, the tip tapering along its entire length to a point and being free of any screw threads;

a drill section formed on the shank and extending from the tip to an intermediate position between the tip and the head, the drill section having at least one flute defining a bore cutting edge at the tip of the shank which extends from a radially inner position with respect to said shank to the outer surface of the shank;

a screw thread formed on the outer surface between the head and the tip and terminating at the bore cutting edge of the

MLP 7222
PATENT

tip, an entirety of the screw thread having a uniform height
projecting from the outer surface of the shank; and

the flute further forming a flute edge which intersects the screw thread between the tip and the intermediate position to form at least one thread tapping surface on the screw thread where the a flute edge intersects the thread, so that when the screw is screwed into a work piece, the bore cutting edge drills a bore having a diameter substantially equal to the cross-sectional size of the shank, and the thread tapping surface cuts into the work piece to tap the bore and engage the screw thread with the work piece.

Claim 1 recites essentially the same distinguishable elements as claim 10. That is, claim 1 requires the tip of the screw to taper along its entire length and to be free of any threads, the shank to be of constant maximum radius from the head to the tip (i.e., the entire length of the shank), and the entirety of the screw thread to have a uniform height and terminating at the bore cutting edge of the tip (i.e., the tip). The Examiner stated in the Office action that claim 1 is rejected under §103 as being unpatentable over Holmes et al. as applied to claim 10. Accordingly, for reasons discussed above with respect to claim 10, Applicants assert that proposed claim 1 is patentable for the same reasons as proposed claim 10.

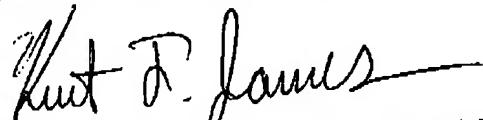
Claim 2-9 depend directly or indirectly from claim 1 and are patentable for at least the same reasons as claim 1.

MLP 7222
PATENT

Conclusion

In view of the foregoing, favorable consideration and allowance of claims 1-21 is respectfully requested.

Respectfully submitted,



Kurt F. James, Reg. No. 33,716
SENNIGER POWERS
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102
(314) 231-5400

KFJ:JHC/mlt.
Via Facsimile 703-872-9306